

CLAIMS

We claim:

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1. An apparatus, comprising:

    a stack of printing plates;

    a vacuum system for picking up an edge of a top printing plate from the stack of printing plates; and

    a peeling system including a pair of rotatable belts, a plurality of plate feed beams attached to, and extending between, the pair of rotatable belts, and a drive system for rotating the pair of rotatable belts to displace the plurality of plate feed beams between the top printing plate and an underlying printing plate in the stack of printing plates, thereby peeling the top printing plate from the stack of printing plates.

2. The apparatus of claim 1, wherein each plate feed beam includes at least one roller.

3. The apparatus of claim 2, wherein each roller is attached to a shaft coupled to the plate feed beam.

4. The apparatus of claim 3, wherein the roller is freely rotatable about the shaft.

5. The apparatus of claim 1, wherein each end of each plate feed beam includes an intermediate connector, and wherein the intermediate connectors are attached to corresponding couplers located on an outer surface of the rotatable belts.

6. The apparatus of claim 5, wherein each intermediate connector includes an anti-rotation device.

7. The apparatus of claim 6, wherein the anti-rotation devices are configured to maintain the plate feed beams perpendicular to a tangent line of the rotatable belts.

8. The apparatus of claim 6, wherein each plate feed beam includes at least one roller, and wherein the anti-rotation devices are configured to maintain the plate feed beam rollers in contact with an underside of the top printing plate.

9. The apparatus of claim 6, wherein each anti-rotation device comprises a pair of protruding legs configured to cradle opposing sides of a corresponding coupler and extend partially over the outer surface of the rotatable belt on which the coupler is located.

10. The apparatus of claim 1, wherein the drive system displaces the plurality of plate feed beams between a "home" position, wherein none of the plate feed beams contact the top printing plate, and a "plate loaded" position, wherein the top printing plate is completely removed from the stack of printing plates by the plate feed beams.

11. The apparatus of claim 10, further comprising a sensor system for detecting when the plate feed beams are in their "home" and "plate loaded" positions.

12. The apparatus of claim 11, wherein the sensor system comprises first and second shafts each including a flag, a first sensor for detecting the flag on the first shaft, and a second sensor for detecting the flag on the second shaft.

13. The apparatus of claim 12, wherein the first and second shafts are biased in opposite directions.

14. The apparatus of claim 13, wherein the first and second shafts are spring-loaded.

15. The apparatus of claim 12, wherein one of the rotatable belts includes a first boss and a second boss, wherein the first boss is configured to actuate the first shaft to displace its flag over the first sensor, thereby providing an indication that the plate feed beams are in their "home" position, and wherein the second boss is configured to actuate the second shaft to displace its flag over the second sensor, thereby providing an indication that the plate feed beams are in their "plate loaded" position.

16. The apparatus of claim 15, wherein the first boss and the second boss are located on an outer surface of the rotatable belt.

17. The apparatus of claim 15, wherein the first boss actuates the first shaft during a rotation of the rotatable belt by the drive system in a first direction, and wherein the second boss actuates the second shaft during a rotation of the rotatable belt by the drive system in a second, opposite direction.

18. The apparatus of claim 1, wherein the plate feed beams do not contact a surface of the underlying printing plate in the stack of printing plates.

19. The apparatus of claim 18, wherein the surface of the underlying printing plate comprises an emulsion.

20. The apparatus of claim 1, wherein each printing plate comprises:  
a substrate; and  
an imageable layer formed on the substrate.

21. The apparatus of claim 20, wherein the imageable layer has characteristics selected from the group consisting of:  
photosensitive, radiation sensitive, and thermally sensitive.

22. The apparatus of claim 20, wherein the plate feed beams do not contact the imageable layer of the underlying printing plate in the stack of printing plates.

23. The apparatus of claim 1, wherein the rotatable belts comprises endless belts.

24. The apparatus of claim 1, wherein the stack of printing plates and the peeling system are located within a cassette.

25. The apparatus of claim 1, further comprising:  
a media support surface;  
a mounting system for mounting the top printing plate on  
the media support surface; and  
a scanning system for imaging data onto the top printing  
plate.

26. The apparatus of claim 25, wherein the media support  
surface comprises an external drum.

27. The apparatus of claim 26, further including a drive system  
for rotating the external drum during data imaging.

28. A method, comprising:

providing a stack of printing plates;

picking up an edge of a top printing plate from the stack of printing plates; and

peeling the top printing plate from the stack of printing plates using a peeling system including a pair of rotatable belts, a plurality of plate feed beams attached to, and extending between, the pair of rotatable belts, and a drive system for rotating the pair of rotatable belts to displace the plurality of plate feed beams between the top printing plate and an underlying printing plate in the stack of printing plates.

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29. The method of claim 28, further comprising:

providing each plate feed beam with at least one freely rotatable roller.

30. The method of claim 29, further comprising:

maintaining the plate feed beam rollers in contact with an underside of the top printing plate.

31. The method of claim 28, further comprising:

maintaining the plate feed beams perpendicular to a tangent line of the rotatable belts.

32. The method of claim 28, further comprising:  
rotating the plurality of plate feed beams between a "home" position, wherein none of the plate feed beams contact the top printing plate, and a "plate loaded" position, wherein the top printing plate is completely removed from the stack of printing plates by the plate feed beams.

33. The method of claim 32, further comprising;  
detecting when the plate feed beams are in their "home" and "plate loaded" positions.

34. The method of claim 28, further comprising:  
preventing the plate feed beams from contacting a surface of the underlying printing plate in the stack of printing plates.

35. The method of claim 34, wherein the surface of the underlying printing plate comprises an imageable layer.

36. The method of claim 28, further comprising:  
enclosing the stack of printing plates and the peeling system within a cassette.

37. The method of claim 28, further comprising:  
mounting the peeled top printing plate on a media support  
surface; and  
imaging data onto the top printing plate.

38. The method of claim 37, further comprising:  
rotating the media support surface during data imaging.

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39. An apparatus, comprising:

a cassette containing a stack of printing plates and a peeling system, wherein the peeling system is configured to peel the top printing plate from an underlying printing plate of the stack of printing plates without contacting the underlying printing plate.

40. The apparatus of claim 39, wherein the peeling system includes a pair of rotatable belts, a plurality of plate feed beams attached to, and extending between, the pair of rotatable belts, and a drive system for rotating the pair of rotatable belts to displace the plate feed beams between the top printing plate and the underlying printing plate in the stack of printing plates, thereby peeling the top printing plate from the stack of printing plates.